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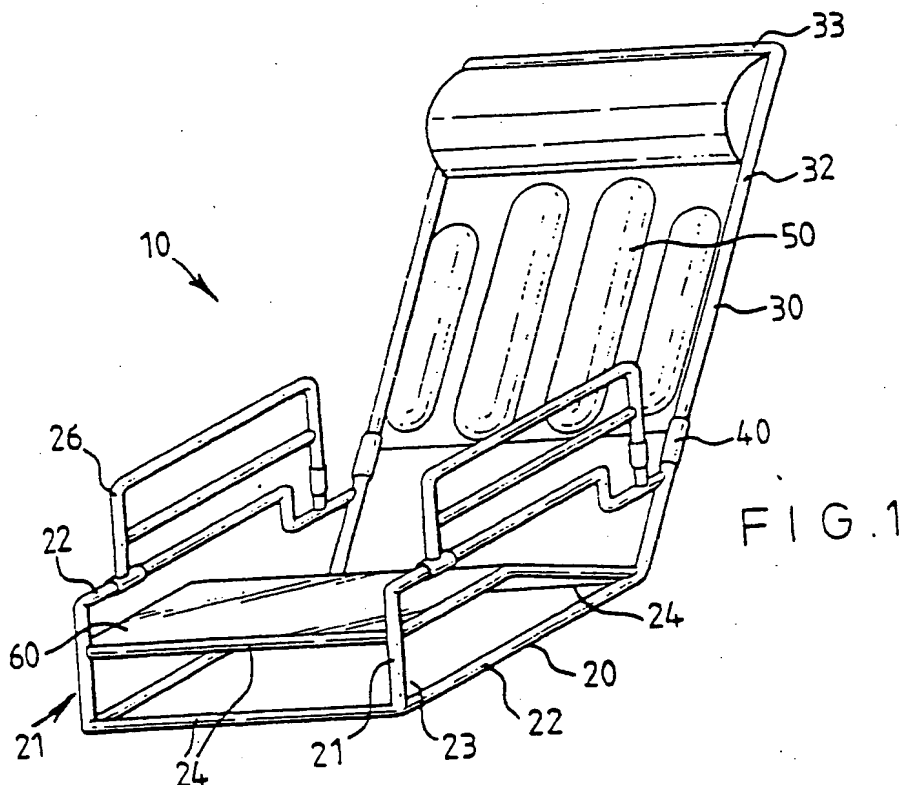
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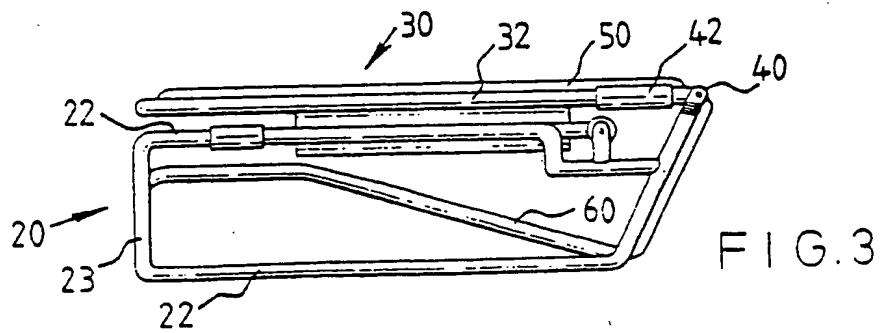
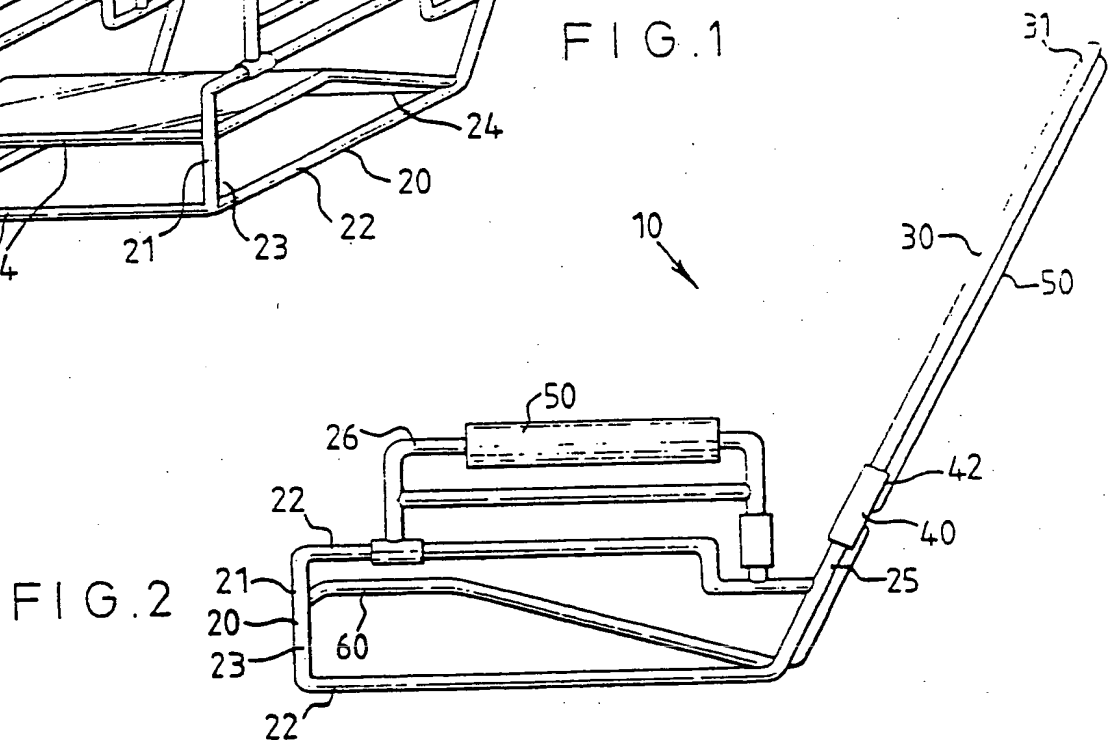
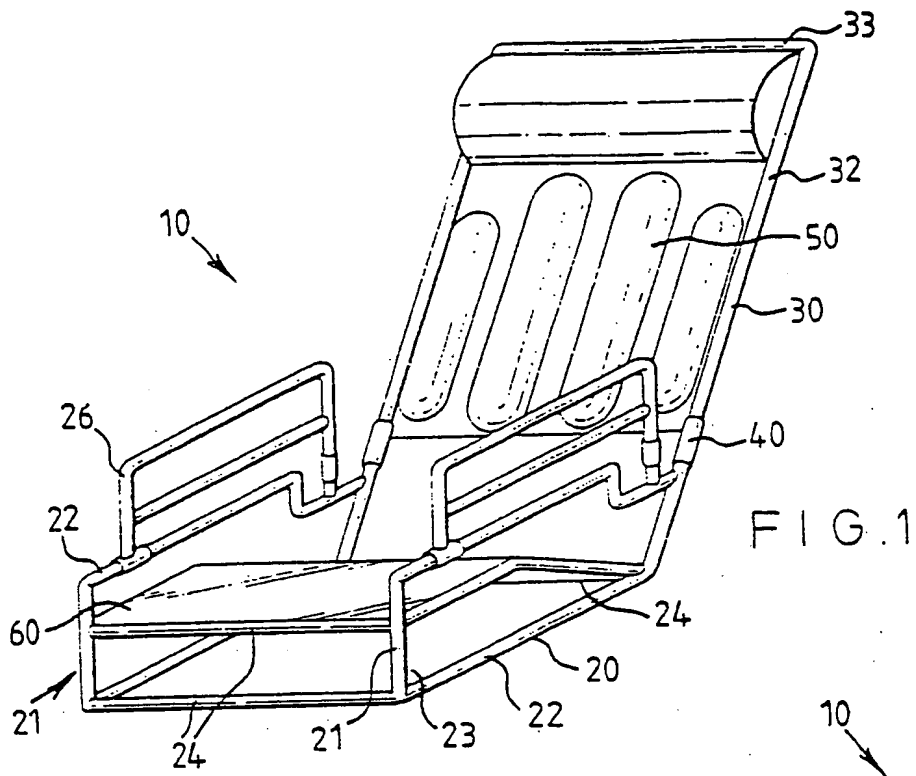
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(54) Child's seat for use in a vehicle

(57) A child's car seat having a frame with a base portion (20) and a back portion (30) for supporting seat (60) and back (50) support members respectively. The base and back portions are pivotably connected (at 40) and the connection is lockable in the open position. The construction allows the seat to be folded neatly when not required with the back portion laying substantially parallel to the base portion. The padding for the car seat includes inflatable cushions. The seat has adjustable arm rests (26) and a storage drawer (not shown).





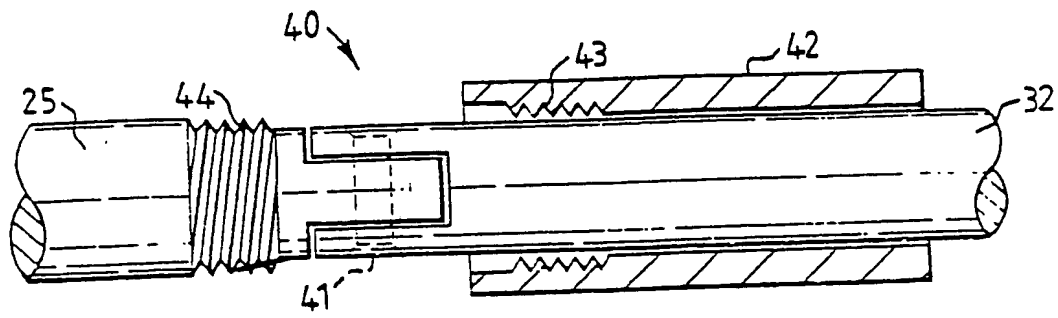


FIG 4

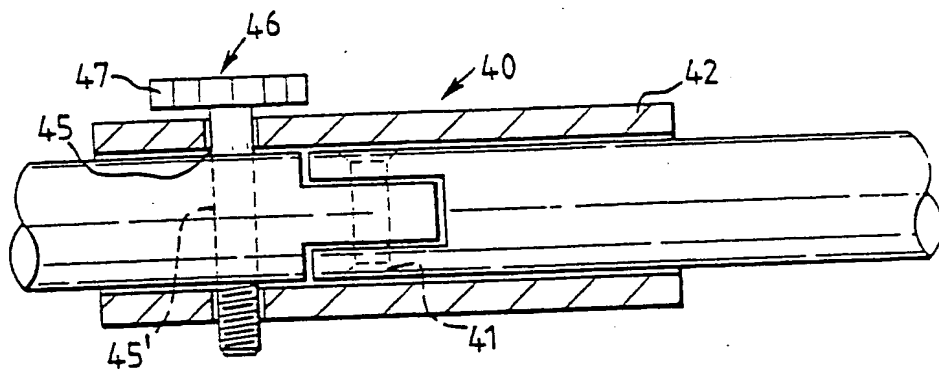


FIG.5

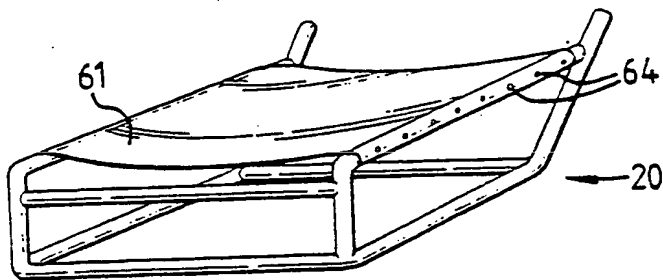


FIG. 6

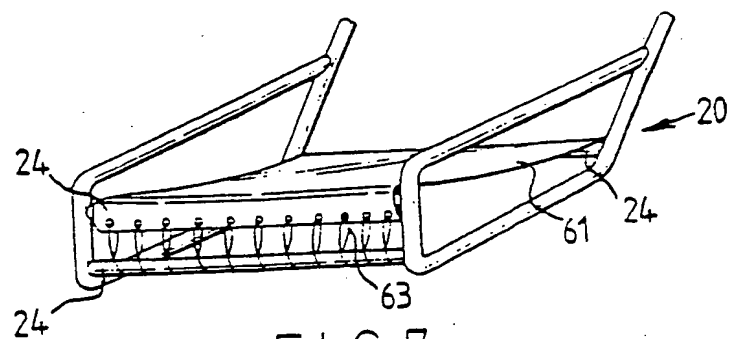


FIG.7

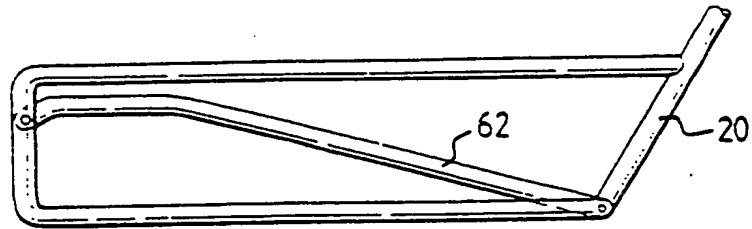


FIG. 8

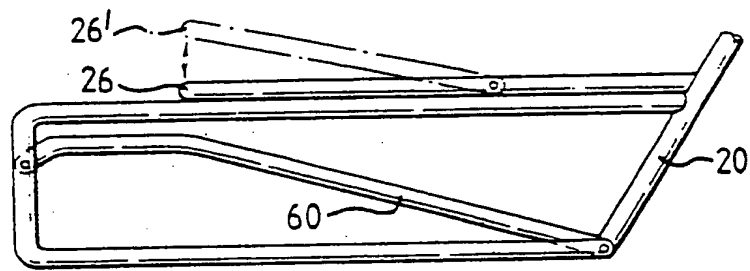


FIG. 9

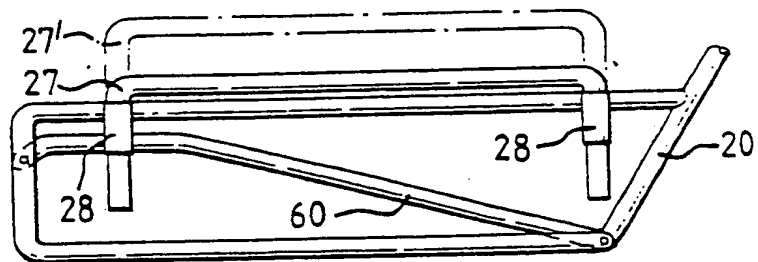


FIG. 10

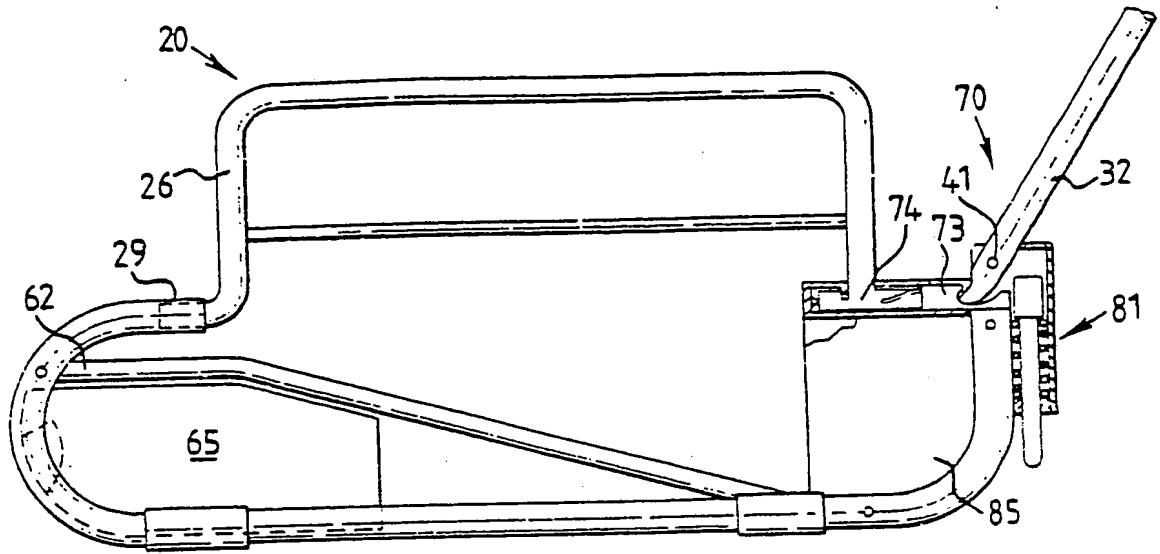


FIG. 11

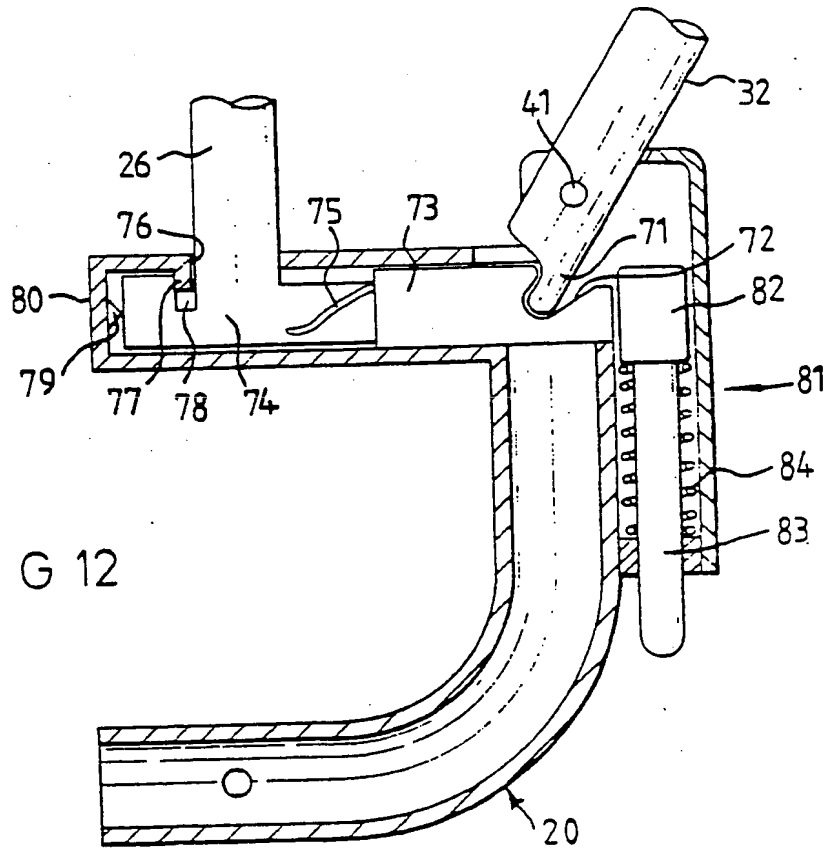


FIG. 12

CAR SEAT

This invention relates to car seats for infants and very young children.

Car seats are used to provide a more appropriate
5 support for young children who are too small to be properly supported in a standard car seat. Usually, the seats are of a unity construction and are placed on top of the rear seat of the vehicle and held in position by special anchorage straps and/or make use
10 of the existing seat belt arrangement fitted to the rear seat of the vehicle. The car seat provides the necessary support and restraints required to protect the child using the car seat. Presently available car seats are bulky and when not in use occupy a large
15 volume due to their bulky and rigid construction. Usually, when not in use the car seat is left in its position on the rear seat preventing an adult from occupying that seat. If removed to allow the seat to be used, it is usually stored in the boot of the
20 vehicle where it occupies a large percentage of the available space.

The present invention allows for the construction of a child's car seat which is simple in construction and allows the car seat to be folded for neat storage
25 occupying a small volume and certain embodiments may

be constructed to allow the car seat, when not required, to be folded and stored under the front seat of the vehicle.

Accordingly, the present invention provides a child's
5 car seat comprising a frame having a base portion and
a back portion, a seat support member, a back support
member and padding covering at least a portion of the
frame, seat support member and back support member,
characterised in that the frame is of a spaced frame
10 construction and being articulated between the base
portion and back portion to be pivotable with respect
to the base portion from an open position to a closed
position in which the back portion lays substantially
parallel to the base portion.

15 One preferred embodiment of the invention will now be
described, by way of example only, with reference to
the accompanying drawings in which:

Figure 1 is a perspective view of a child's car seat
in accordance with the invention;

20 Figure 2 is a side view of the seat of Figure 1
showing the base and back frame portions and the
connection therebetween;

Figure 3 illustrates the seat in the folded position;

Figure 4 is an enlarge view of the connection between the two portions;

Figure 5 is an alternative to the connection shown in
5 Figure 3;

Figure 6 illustrates one method of fitting a seat to the frame;

Figure 7 illustrates an alternative seat;

Figure 8 illustrates yet another seat;

10 Figures 9 & 10 illustrate alternative arm rests; and

Figures 11 & 12 illustrate a mechanism for opening the seat.

As can be seen in Figure 1 the child's car seat has a spaced frame construction. The frame 10 is preferably
15 constructed from metallic tube (either round or square) for strength and lightness or from rod.

The frame 10 has two main portions, a base portion 20 and a back portion 30. The base portion 20 has two

side sub-frames 21. Each sub-frame has two horizontal members 22 held apart by two verticle members 23. The sub-frames 21 are held in fixed relationship by stays 24. The number of fore and aft stays will depend on the design of the seat but 2 fore stays and 1 aft stay are shown in Figure 1.

The back portion 30 comprises a frame 31 of a substantially inverted "U"-shape having arms 32 and a horizontal member 33. Means may be connected to the horizontal member 33 for anchoring the seat to the vehicle. This is preferably in the form of a strap and buckle of seat belt type construction 34 for connecting the seat to the standard child restraint anchorage point built into the rear parcel shelf of passenger vehicles. The back support member 51 is accommodated by or fitted to this "U"-shaped frame 31. The back support member is of a construction similar to the seat support member 60 which will be described hereinafter.

The base portion 20 and the back portion 30 are articulated by means of a pivot joint 40. This joint allows the seat to be folded from the open position shown in Figure 1 to the folded position shown in Figure 3. In the folded position the base portion 20 and the back portion 30 lay in facing relationship in

a substantially contiguous condition. In this folded position the seat occupies a small volume and certain embodiments may be sufficiently small to be stored under the rear of a front seat of the vehicle thus
5 allowing the seat where the car seat is usually anchored to be occupied by a grown person without sacrificing the space available in the boot (trunk) of the vehicle.

Each joint 40, which is more clearly illustrated in
10 Figures 4 and 5 comprises a pivot pin 41 interconnecting a spigot 25 formed as part of the base portion 20 of the frame and the lower end of an arm 32 of the back portion 30 of the frame. The pivot pin allows the two portions to pivot with respect to each
15 other while securely interconnecting them.

A sleeve 42 is slidable over the spigot 25 and the arm 32 and is a firm sliding fit there over. The sleeve is arranged so that when it is slid over the pivot pin 41 the joint is locked and becomes substantially
20 rigid. Of course, the sleeve can be slid over the joint/pivot pin only when the spigot 25 and arm 32 are aligned.

The sleeve may be securable in the locked position to prevent accidental release of the joint.

Alternatively, gravity and the firmness of the slidable fit of the sleeve over the joint may be sufficient. If the sleeve is of circular cross-section, an internal screw thread may be formed
5 in the sleeve and arranged to mate with a corresponding screw thread on the spigot. Thus the sleeve is secured in the locked position by mating the screw threads (see Figure 4).

If the sleeve is of square cross-section, it can be
10 held in the locked position by a pin or fixing screw 46. If a fixing screw is used as illustrated in Figure 5 the shaft of the screw 46 passes through a hole in the sleeve and a correspond hole 45 in either the spigot (as shown) or the arm of the back portion
15 (not shown). The thread of the screw 46 would mate with a corresponding thread in the hole in the sleeve and this thread may be at either the leading or trailing side of the hole (trailing side illustrated). Alternatively, the thread could mate
20 with a thread formed in the hole through the spigot or arm. The fixing screw 46 has a thumb-wheel head 47 to facilitate easy operation of the screw by hand. In Figures 4 and 5 the sleeve 42 is shown in phantom for clarity.

25 The seat support member 60 may take any convenient

style to suit the manufacturer and/or the end user. Three alternatives are shown in the drawings. Figure 6 illustrates a fabric seat support. The fabric 61 is stretched between the side sub-frames 21 to provide a
5 seat of the trampaline style. The spring being gained by the inherent "give" in the frame 10. The fabric 61 may be stretched between the upper horizontal members 22 or between special members supported by the sub-frames 21 (not illustrated).

10 Figure 7 illustrates an alternative fabric seat support in which the fabric 61 is stretched between fore and aft stays 24 used to hold the sub-frames apart. The fabric 61 in either the arrangement of Figure 6 or 7 may be laced 63 around the supports to
15 allow the tension to be adjusted as the fabric stretches or rivetted 64 or otherwise directly attached to the supports.

Figure 8 illustrates a moulded plastic seat support. This provides a more rigid seat which adds to the
20 strength of the frame. Again, this support may be connected directly to the sub-frames and/or the stays or to special support bars fitted to the sub-frames.

Padding 50 is provided to protect the user from the hard portions of the seat especially the frame and to

add to the comfort of the user while in the car seat. While standard padding may be used, the preferred embodiment has at least a portion of the padding made from inflatable cushions. This allows the padding to
5 be deflated when not in use to provide a more compact folded seat.

Side arms 26 may be provided to give added side ways support to the user by acting as side walls to the base of the seat as well as provide arm rests for the
10 user. These side arms may be pivotably connected to the sub-frames 21 and have at least one of the pivotable connections lockable in the open or operational position.

Figure 9 illustrates an alternative pivotal arm rest
15 in which the arm rest (26) is pivotally connected to the frame (20) so that the arm rest can be pivotted from a folded position (shown solid) to the open position (shown in phantom as 26'). Of course, the arms could be pivotted from the other end.

20 The side arms may be slidably connected to the frame (20) as shown in Figure 10. Slidable side arms (27) are slidable between a folded position (shown solid) and an open position (shown in phantom as 27'). The side arms (27) have downwardly extending ends slidably

mounted in mounts (28) and securable in at least the open position but preferably in a plurality of positions between the open and folded positions to provide a choice in the position of the arm rests when
5 in use.

Figures 11 & 12 illustrate a mechanism (70) for automatically opening the arm rests as the back portion is opened and locking the chair in the open position. The mechanism comprises a finger formed on
10 the end of each arm (32) of the back portion (30). Each finger engages with a recess (72) of a respective slide or bush (73) as the seat is opened. The slide is moved forward by the finger and slides over a stub shaft (74) connected to one end of the side arm. A
15 tongue and groove connection between the slide and the shaft causes the shaft to rotate through 90 as the slide moves over the shaft under the influence of the back portion of the seat. The groove (75) is shown on the shaft (74). The other end of the arm rest is
20 pivotably connected to the frame (20) by a bushing (29) such that the bushing is located in the hollow frame and the end of the arm rest is inserted into the bushing (29).

As can be more clearly seen in Figure 12 in which the
25 small portion of the frame (20) shown, is shown in

section for clarity, the part of the frame housing the stub shaft has a slot allowing the arm rest to pivot with respect to the frame while accommodating the shaft and the end of the arm rest within the frame.

5 Along one edge of the slot (76) is formed a tongue (77) which is located in a second groove (78) in the shaft. This tongue and groove prevents or limits axial movement of the shaft with respect to the frame. A bearing (79) formed on the end (80) of the

10 frame (20) of the base portion provides a low friction connection between the frame and the shaft when the seat is being opened.

A locking mechanism (81) is provided behind each slide for locking the slide in the forward position

15 corresponding to the open position of the seat. The locking mechanism comprises a stopper (82) having a shaft (83) and a spring (84) biasing the stopper to the locked position. The stopper blocks the return passage of the slide. In the folded position the

20 slide is drawn backwards and the stopper is urged upwardly by the spring but is prevented by the slide. As the seat is opened the finger engages the slide and moves it forward causing the arm rests to rotate to the open position. Once the slide is clear of the

25 stopper (82), the stopper under the urgings of the spring, moves upwardly to block the return of the

slide thus preventing the folding of the seat. The contact between the finger (71) and the slide (73) holds the back portion (30) of the seat in the open position. To fold or close the seat, the stopper is
5 moved downwardly to clear the slide (73). This may be achieved by pulling downwardly on the shaft (83). Once the stopper has closed the slide may move rearwardly allowing the back to fold down and folding the arms simultaneously.

- 10 A plate (85) may be used to hide the mechanism from show and provide extra strength to the corner.

A drawer (65) may be provided under the seat to allow storage of small items. This is most readily provided when a hard seat support member is used such as the
15 moulded plastic seat (62) discussed previously. This makes use of the available space which is otherwise left unused in the firm seat configuration. A handle (66) (shown in phantom in Figure 11) is moulded into the drawer. The drawer is preferably made of a
20 moulded plastics material. Small items such as small toys or tissues for the occupant may be conveniently stored therein.

The invention allows the construction of an embodiment which, when folded for storage, measures only 14" x

15" x 4", small enough to fit under the front seat of most family passenger vehicles.

As will be readily apparent to those skilled in the art to which this invention relates, many variations
5 from the embodiment described are possible without departing from the spirit of the invention as defined by the following claims and such variations fall within the scope of these claims.

CLAIMS

1. A child's car seat comprising:
a frame, having a base portion and a back portion
a seat support member;
5 a back support member; and
padding covering at least a portion of the frame, seat
support member and back support member, characterised
in that the frame is of a spaced frame construction
and being articulated between the base portion and the
10 back portion to allow the back portion to be pivotable
with respect to the base portion between an open
position and a closed position in which the back
portion lays substantially parallel to the base
portion.
- 15 2. A child's car seat as defined in claim 1 wherein
the back portion is substantially in the shape of an
inverted "U" and the back support member is
accommodated by the back portion.
3. A child's car seat as defined in claim 2 wherein
20 the horizontal portion of the inverted "U"-shaped back
portion is adapted to provide anchorage means for
securing the car seat within a vehicle.
4. A child's car seat as defined in any one of the

preceding claims wherein the base portion of the frame has respective rectangular side sub-frames between which the seat support member is located.

5. A child's car seat as defined in claim 4 wherein
5 the seat support member comprises a fabric stretched between the respective sub-frames.

6. A child's car seat as defined in claim 4 wherein
the seat support member comprises a fabric stretched
between fore and aft stays holding the respective side
10 sub-frames in spaced relationship.

7. A child's car seat as defined in claim 4 wherein
the seat support member is of a moulded plastic
construction supported by the side sub-frames and fore
and aft stays holding the sub-frames in spaced
15 relationship.

8. A child's car seat as defined in claim 4 wherein
the base portion has seat anchorage means incorporated
in each sub-frame.

9. A child's car seat as defined in claim 8 wherein
20 the seat anchorage means is arranged to receive a
standard car seat belt to secure the car seat to the
seat of the vehicle.

10. A child's car seat as defined in any one of the preceding claims wherein the back portion comprises a frame substantially in the shape of an inverted "U" connected to the base portion by lockable pivot
5 connections.

11. A child's car seat as defined in claim 10 wherein the frame of the back portion is substantially of rod or tubular construction and each lockable pivot connection comprises a pivot connection provided
10 between an arm of the "U" and a spigot provided on the base portion, and a sleeve slidable over the pivot connection to a locked position when the arm and respective spigot are aligned, to prevent relative movement between the arm and respective spigot.

15 12. A child's car seat as defined in claim 11 wherein the sleeve is securable in the locked position by mating a screw thread on the spigot with a corresponding screw thread in the sleeve.

13. A child's car seat as defined in any one of the preceding claims further including arm rests wherein
20 the arm rests are slidable from a closed position to an open position and releasably fixable in the open position.

14. A child's car seat as defined in claim 4 wherein each sub-frame further includes an arm rest pivotable between a closed position and an open position and releasably fixable in the open position.

5 15. A child's car seat as defined in claim 13 or 14 wherein the arm rests automatically move from the closed position to the open position when the back portion moves from the closed position to the open position.

10 16. A child's car seat as defined in any one of the preceding claims wherein the padding includes inflatable cushions.

17. A child's car seat as defined in any one of the preceding claims further comprising a drawer arranged
15 to be accommodated within the base portion and located under the seat support member.

18. A child's car seat substantially as hereinbefore described with reference to the accompanying drawings.